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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/019,201	12/20/2001	Kazuhiro Maeno	TIC-0010	9902

7590

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EXAMINER

CHU, CHRIS C

ART UNIT

PAPER NUMBER

2815

DATE MAILED: 03/14/2003

8

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/019,201

Applicant(s)

MAENO ET AL.

Examiner

Chris C. Chu

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 09 December 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1 - 10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 - 10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 09 December 2002 is: a) ☒ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                  | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____  |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)         | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____                                    |

## **DETAILED ACTION**

### ***Response to Amendment***

1. Applicant's amendment filed on December 9, 2002 has been received and entered in the case.

### ***Claim Objections***

2. Claim 7 is objected to because of the following informalities:

In line 4, "the" should be removed

or

In lines 5 and 6, "of" should be --or--.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1, 2, 4 and 6 are rejected under 35 U.S.C. 102(b) as being anticipated by Sugawara et al.

Regarding claim 1, Sugawara et al. discloses in Fig. 3, Fig. 4 and column 4, lines 24 ~ 28 a semiconductor device, comprising:

- a plurality of semiconductor elements (3, right side) arranged on a substrate (2, right side); and
- a main current electrode (5) which is arranged near said plurality of semiconductor elements and vertically apart from the surface of the substrate, wherein;
- each of said plurality of semiconductor elements (3, right side) and said main electrode are electrically connected, and
- wherein said main current electrode is arranged above one of said plurality of semiconductor elements or wiring pattern (Cu patterns on 2) connected to the one of said plurality of semiconductor elements.

Regarding claim 2, Sugawara et al. discloses in Fig. 3 and Fig. 4 each of said plurality of semiconductor elements and said main current electrode being connected by wire bonding (6a).

Regarding claim 4, Sugawara et al. discloses in Fig. 3 and Fig. 4 a thermal conductor member (1) at a bottom of the semiconductor device, wherein said plurality of semiconductor elements are directly or indirectly connected to said thermal conductor member so that they are thermally coupled.

Regarding claim 6, Sugawara et al. discloses in Fig. 3 and Fig. 4 said plurality of semiconductor elements being arranged in one row or a plurality of rows.

*Claim Rejections - 35 USC § 103*

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sugawara et al. in view of Bryan.

Sugawara et al. discloses the claimed invention except for the plurality of semiconductor elements being switching elements. However, Bryan teaches in column 5, lines 59 ~ 60 semiconductor elements being switching elements. Thus, it would have been obvious to one of ordinary skill in the art at the time when the invention was made to modify Sugawara et al. by using the semiconductor elements to be switching elements as taught by Bryan. The ordinary artisan would have been motivated to modify Sugawara et al. in the manner described above for at least the purpose of improving crosspoint switching circuit (column 5, line 56).

7. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sugawara et al. in view of Dubelloy.

Sugawara et al. discloses the claimed invention except for the thermal conductor member being formed with a ceramic material. However, Dubelloy teaches in column 3, lines 31 ~ 33 a thermal conductor member being formed with a ceramic material. Thus, it would have been obvious to one of ordinary skill in the art at the time when the invention was made to modify

Sugawara et al. by using the ceramic material for the thermal conductor member as taught by Bryan. The ordinary artisan would have been motivated to modify Sugawara et al. in the manner described above for at least the purpose of providing a good electrical insulator (column 3, line 32).

8. Claims 7 ~ 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sugawara et al. in view of Ota et al. (JP 6-283639).

Regarding claim 7, Sugawara et al. discloses in Fig. 3, Fig. 4 and column 4, lines 24 ~ 28 a semiconductor device including one or a plurality of semiconductor elements (3), comprising:

- a substrate (2) on which the one or the plurality of semiconductor elements are arranged;
- a case (4) that is arranged in a predetermined position relative to said substrate so that the one of the plurality of semiconductor elements are surrounded; and
- a member (14) on which a main current electrode of the one of the plurality of semiconductor elements and a terminal for electrically connecting said semiconductor device and a circuit external to said semiconductor device are formed integrally,
- wherein said member is arranged in a position apart from said substrate by using said case without directly contacting said substrate.

Sugawara et al. does not disclose the member being a metal. However, Ota et al. teaches in Fig. 1 a member (5) being a metal. Thus, it would have been obvious to one of ordinary skill in the art at the time when the invention was made to modify Sugawara et al. by using the metal for the member as taught by Bryan. The ordinary artisan would have been motivated to modify

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Sugawara et al. in the manner described above for at least the purpose of reducing the size of the integrated circuit (abstract, lines 28 ~ 30).

Regarding claim 8, Sugawara et al. discloses in Fig. 3 and Fig. 4 said metal member being arranged above the one or the plurality of semiconductor elements or a wiring pattern connected to the one or the plurality of semiconductor elements.

Regarding claim 9, Sugawara et al. discloses in Fig. 3 and Fig. 4 said metal member and the semiconductor device being electrically connected by wire bonding (6b).

Regarding claim 10, Sugawara et al. discloses in Fig. 3 and Fig. 4 said case (4) including a frame portion surrounding the one or the plurality of semiconductor elements; and said metal member is fixed to the frame portion of said case.

### *Response to Arguments*

9. Applicant's arguments with respect to claims 1 and 7 have been considered but are moot in view of the new ground(s) of rejection.

### *Conclusion*

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

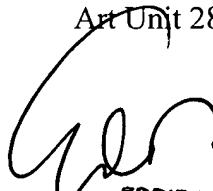
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chris C. Chu whose telephone number is (703) 305-6194. The examiner can normally be reached on M-F (10:30 - 7:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie C. Lee can be reached on (703) 308-1690. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7382 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Chris C. Chu  
Examiner  
Art Unit 2815

c.c.  
March 7, 2003

  
**EDDIE LEE**  
**SUPERVISORY PATENT EXAMINER**  
**TECHNOLOGY CENTER 2800**